

Emdt A

413



SEQUENCE LISTING

<110> Owens, Gary K.
Manabe, Ichiro

<120> METHODS AND COMPOSITIONS FOR EXPRESSING POLYNUCLEOTIDES
SPECIFICALLY IN SMOOTH MUSCLE CELLS IN VIVO

<130> 021258-000200US

<140> 10/057726
<141> 2002-01-24

<150> US 60/263,811
<151> 2001-01-24

<150> US 09/600,319
<151> 2000-07-13

<150> WO PCT/US99/01038
<151> 1999-01-15

<150> US 60/071,300
<151> 1998-01-16

<160> 23

<170> PatentIn Ver. 2.1

<210> 1
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG1 sequence
to be mutated

<400> 1
ttccctttat gg

12

<210> 2
<211> 11
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG1 mutated
sequence

<400> 2
ggatcctatg g

11

<210> 3
<211> 10

<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG2 sequence
to be mutated

<400> 3
cctttttggg

10

<210> 4
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG2 mutated
sequence

<400> 4
atcccttggg

10

<210> 5
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Intronic CArG
sequence to be mutated

<400> 5
ccttgatgg

10

<210> 6
<211> 10
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Intronic CarG
mutated sequence

<400> 6
aggcctatgg

10

<210> 7
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG1 sense

strand EMSA probe

<400> 7
gacttccttt tatggcctga

20

<210> 8
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG2 sense
strand EMSA probe

<400> 8
cctggccttt ttgggttgg

20

<210> 9
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Intronic CArG
sense strand EMSA probe

<400> 9
catgcccttg tatggtagtg

20

<210> 10
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Insulin PCR
primer 1

<400> 10
gccaataactc tagggacttt aggaaggatg

30

<210> 11
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Insulin PCR
primer 2

<400> 11
gccggcaac ctccagtgcc aaggctgaa gatc

34

<210> 12
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Beta-globin
PCR primer 1

<400> 12
cagcgtttc ttcagaggga gtacccagag 30

<210> 13
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Beta-globin
PCR primer 2

<400> 13
tcagaagcaa atgtgaggag cgactgatcc 30

<210> 14
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Skeletal
alpha-actin PCR primer 1

<400> 14
caggctgaga agcagccgaa gggactctag 30

<210> 15
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Skeletal
alpha-actin PCR primer 2

<400> 15
acctccaccc tactgctgc tctgactctg 30

<210> 16
<211> 16011
<212> DNA
<213> Rattus sp.

<400> 16

agatcttaaa acacatcaac ctgggctgag gggatgtgtg tctctgtgc tgttatgca 60
catgcattt aggccagatg aaaatgtcag atgtcctctc actgctttat tcccttgaga 120
cagggtccct cactgaactt gttggagcta tgctggtagc cagcaagccc cagtggcctt 180
cctgtctcta tctcacacag cacaatatgt gtggccatgc tccactttt tacatggaaa 240
ttggggtctt ccaactgggg ttctcattt tgcaatgaca ctctccccca ctgagccatc 300
tcctcaggcc agctgatata tttttaata attaaatatt tagcacatgc ctttagaagc 360
caatagctat ttaaagctgt ttgcttaaaa aaaaaaaaaaaaaaa aaaaaaagact tcattatccc 420
aacactttagt agggagagac aataattcca aaaccagaac cagccaggggt acacagttag 480
actttatata aaaaaaaaaaaaaaa aaaaagaaaag aaagaaaaaa aaaagaaaaaa gaaaaaaaaa 540
ggctccaaag agaaatttcc ctttcatcat ctaatcacaa gaaaacaatt tatttatttt 600
gacatcaactc agtccaaagg agcttttgt aaagtgactt ctcttcttaa aataagtgac 660
ccttccaaac cacaaaaaac aaaacagaaa cctctggcct gttcttagatg ccttttgaag 720
acttcagata cctgaagagt ggacagatat ttaccgagtg acttaaatga acatactgtc 780
cctgggtact gctcaagcat gccaggagag catggatggt ttatgcaagg ctggcactgt 840
cattaacaac tcagtaaggc ggagaagaca gagagcctc cctaagacaa tggcacataa 900
ggacatgggt aacccagag gttcccgct agtacttagc agagctgaga tcagacttgg 960
gcctctgtgc tgcctgcct agtgggcaac actcaagact gggtaaaca ataagttgat 1020
ctggatatg gtcagtaat cacactgaga attcaacact gggaaaggcag aggaggatcc 1080
ctgggattgc tgcctggctc tctagcagcc tagcagaatc aacaaactcc aggttcagtg 1140
agagatgctc acaaataaaa atggaggagc aactgaacac actcagtgtt gaccacaca 1200
cacactaaag aacacgtgt a cCACACAGAC acagacacag gataacctac ccattttgtg 1260
tatggactca gccagccag gttggaaact cagttcctc gtttaactctt ttcaaaccctg 1320
ggtcctcagc gatgtgctgg ggaacctact tcacggcatt attctggca ttagatgtaa 1380
aggaagcagt aaagttccc tttcttgac tgaggtgatg cgagaatgag ggcctgaatt 1440
ccatctctag gactcacata aagacaccca gactgcactg gccagtaagc ctcacctatg 1500
cctccaagcc tggctgtgag agactgtctc aaaaacaaaag taaaaacaac aaaatcaatg 1560
tcagatgtgc acacatcgaa tcccagcatg tgcacggcat gcttgcagtc agccttggtt 1620
acagagagtt ctggccaac cagctataca cagtgagacc ctgtggtaga cggctccctaa 1680
gaactgacat ttgtgactga cagatgtgca catctaccac atgcacatca cagtttccat 1740
tttacaaaaa ggttaacact tactaattga tttagggagtg gggcacccca ctgctacatg 1800
tgaagccag agaatgatgt gttccagtcg gtcagttgtg tccttccacc atgttaggtcc 1860
taaaaaatgga actcaaggca gtcttggcag caagtgcctt atccatagtg ccatttttatt 1920
ggcccagtct ccttataatg aaattatttg tgttccaag ttgatgtaat tctttaaaaa 1980
tcagctgtgc tccttggagt ttgacttcac tgaagcctgc tacaggagtg cccttccttc 2040
ctagcaactag gatggccagc tctgggctgg tttcagacta gggtaggtgc aggtggggcc 2100
tgggcttccc tccttcattc ctccctggct caatgccaag ccggtttcca ttccctttac 2160
gtgcactgcg aagaggcttt ggggaagcgg cctcatccat catgcagaga gctccctcccc 2220
cacctctaca gagagccagc caagctgctg tccttggctc tgctctgtcc accctgttag 2280
gaggctggga tgaggttggg gatggggagg atcaggattc agatgtttc aagtctgaga 2340
agcaggttag cttggcccta gaagaatatg gaaggggtct actgggggtt agatataatg 2400
cactgtatca aagtcaacag gggggctgtg tggcttttc atatccaaa gtcagttgg 2460
tgctggtttc ctaggttcc tgagtccgac aaaggtgcag tggatgtttc tcacaccact 2520
tcaaggactg ttacaaaaaa aaaataggaa ggagctcgat tcgccccctt ttacaggcag 2580
ggtaactaag agccagtaatg tgcctatgtt cctgctgtta taaagaggct cagtagactc 2640
ccattcaaac aactgtgctc agaggcctc tgcacggcattc cccttattgt 2700
ctctggagtg aatattgggaa tattaaacag tactgacctt gctgaggacc ctcagggtac 2760
tcagctcttc tggcctgcaa aatggggctg ggacagggtt gccaggatca tcctctgggt 2820
gggagaacca gctgacacgtg ggtctggagc tcttattatg actggggtcc ccataacgct 2880
ccatgggctc agcgggaggc tgcacggcattc catatttagt cagggggagc cagagccccg 2940
ctggatgccc aagctggaa ttcttggttc gagaattgcg cctggccctt ttgggttgg 3000
tcccggccag gcccaggagg gaggaccgc tcagacccctc gaggggtccgt ggcgggggag 3060
cgaggcgtcc cggcctggc atgaggccaa ctctgcctcg acttcctttt atggcctgag 3120
tgtgagtgca tggagagtgg gagggagggaa gggagagagg gaggaaagaa agcgggggtgg 3180
gggggtgggg ggggggggggt gtcgggggggt gcggagagca gagacagaga cagagagaca 3240
gagagacaca cagagagaga cagagacaca gagagacaca cagagagaga cagagacaga 3300

cacacacaga gagagacaga cagacaaaga gagagacaga gacagagaga cacacacaga 3360
gagacagaca gacaaaaaga gaagagagac agagactta gggacgtaat catcacaggg 3420
aatcaaagc taagagtgt atgaaaagag tgtcaggtca gacaaaagag acaggggcca 3480
agatccgtac agggctaagg gacacagaga ttgagaacac cgagtggtaa gggggcagc 3540
tgacagcagg tccccacat tctcttagag tcttagcatg catcctcaa gtgccataac 3600
gcagtagcaa cccgctttc aacgatgctc agagaaacca ttttattgtt cccaggcacc 3660
ccggttgtag ggtaaaagga gctgcagaga acaagttggaaaacaacatgttcccagcagt 3720
cacagaggat atgcagtgtc ttttttttttttttaagtc ccctcccc 3780
cccccgcccc gccccggct tgctaagcac aaccggctt gaatcttagg aagtggcagg 3840
cgaatgaaga gggatgagg gagagagggt ggcataacttccactatgttatgaacaga 3900
aagaggtaa aatcoagctg gaatggactt agggaagaa attctcaacttccctacag 3960
actctgaaca ccgaatccct tttctctaag gacgcaggat ctgggtggct gcagggagcg 4020
aggcctgagg ctgtgggtca acttgcacgc agccccctt cgcctgcgtt aggtggttcc 4080
cagaggctctt gttcctcacc tgcagggggc gctggaaagg gcagaggacc ctcccacccc 4140
gccccggcagt cacctccccct tccccacccct cggtagcgc tgactctata aagccagatg 4200
tccgaagcat acagagagat ttggaccatc ccagcctggg atcagtgta gatccgagct 4260
ctccatccgg ttttctctg ctatccacc ccagtagcag atctgttataactgatgat 4320
cccttagggg caagcctggg cggtagctt gaggacttcc taaaacatcc tccaggaggt 4380
ggggacccca aggggtctg attgtcatct tttataagga cagtggaaag aagcccgta 4440
caggaccacc cttagacctcc cgtgattact cccattctcc gcaccaaacc agcatcctca 4500
ggttgcctat gaacagaacc acctggaaa gtgggttagg taattaaagg ttctggccac 4560
tgggccccat tccaggtatt ttaagactac agtctaaaaa gcaaacaaaaa tggctactt 4620
aaaaactaac tagtgacaca gtggacaagt gaactgtggt ggaaactgtg ggtctgaatt 4680
caaataccag tattaaaaat aataagaagt ctggataaa tatccactga acatccccag 4740
aataactcaaa acatgggtt aagtttaatg actctgaaca caggccgtt gtttttattc 4800
cactcctaat ggaatgtgtt gttggaaaatt tactggtaaa caaaatgtt taatgttaaa 4860
taaggtcggtt ttttctctg ttacttccaa aacacaaatc tccattaaaa aggaaccttc 4920
tccagtttggtt gggtggggggc agatgcccag gtgggtgtt aggctccatt tgcatcccc 4980
acactgagtg agcagacgtt ggattttggg gtcctcagt gggaaaggta ctctcaggc 5040
agggagagga gctagcagag aaatttatgc tattccagtt cagaatttggaa gaaatcttgc 5100
catgtccaga aagcaccctt caaagttatg tctgtcagag aacagaaaaa ttttttttga 5160
aagccaggac aaggctgtt tggttctact actaagaact gaaaaactgc tgacttgctg 5220
ggaaagaagg aaatccggtt gtgtttggta aactactctg ctgcgttggt ttccctgggg 5280
aggtttttttt ttagttcagt aattcaatattt gctatttttag actcaaagaa agacaggtct 5340
gaaagtctct cataacaaga aacacttttctt tttttatgtt gttgttgatg gcacactaa 5400
caagccagggt gcttaacag cgtttagatg gaactgggtt cttaatca tcatatacac 5460
cttacccctt ctgcacatct ctgttttcc caaaacaaaa atttgttggta ctcctgttcc 5520
tgatggatttccatc gctccatca cttttggtaa aagattggaa ctgtatctttt 5580
accaattttaa aatgacacagactgtctttt aaattttgtt gatgttggtagt tttccctgtg 5640
gatgtggtag ggttccagga ggctggcgtt atctaaaca tgcctggggc aagccaccct 5700
ggagaaacctt ggacttttattt tttttttttt gttttttttt gatgttggtagt 5760
actatggatttattt tttttttttt gttttttttt gttttttttt gatgttggtagt 5820
atggtagt gttttttttt gttttttttt gttttttttt gatgttggtagt 5880
atgcagcctg actggcttga gttttttttt gttttttttt gatgttggtagt 5940
atgaagttctt tttttttttt gttttttttt gatgttggtagt 6000
gaaattttat tttttttttt gttttttttt gatgttggtagt 6060
ataatttttt gttttttttt gttttttttt gatgttggtagt 6120
cagaatcagg tttttttttt gttttttttt gatgttggtagt 6180
gcacttgggg ggtttttttt gttttttttt gatgttggtagt 6240
gccatcctgg actacacttgg gaaacactat tttttttttt gatgttggtagt 6300
cccagcctaa tttttttttt gttttttttt gatgttggtagt 6360
gattaatggaa cccaaagtca gttttttttt gatgttggtagt 6420
gatgttggtagt tttttttttt gatgttggtagt 6480
ccagcgtttt gttttttttt gatgttggtagt 6540
gctagggtttt gatcccccattt gttttttttt gatgttggtagt 6600
cagtagccctt tttttttttt gatgttggtagt 6660
aaactttttt gttttttttt gatgttggtagt 6720

gagcctaatg ccctttggg agcttcaat agataaccca tgtgaagggt ctgacacaag 6780
gctggcacca gcaaagtca gcagatggta atttatagta atatgactag ggacgctaa 6840
gagcatattc tgtatgacac agctgatata aagaaaccca aacggtgcc tttccctaa 6900
agcagaaact caccctaat ttcccttag tgtaatctc atatgtggatt ctttgctccc 6960
tggttctct tctgtcacta gtgaccttt agttacattt atctataggc ttcaaggacc 7020
aggaggcaca gagtcaagag aaaggcaagc aagaatttga agggagaagg aaaccgctca 7080
gcactgtacg aaggggaggt caggctacca tgatgctcct gcgcctcagg gaattatcct 7140
ctcagaatgg ccaacagggt agggacctgg cctgtccac tcaggccat ttgaacttcc 7200
tttctgttct atgggtccct acagatgaat tcagccccact gtagactgga agttcatctt 7260
taacagcattc caaacggaa acatacagac cttcttcctt gtcactgtcc ctgagtcaag 7320
cagcataaga actatgtctg ccaacactcg aggggaagtt gctcaagatg ctatgcaaac 7380
actccagctt tccatggaag ggacttcagc atctatggat ggtggtagca aagcactcct 7440
caagctgatc aaagaatagc tgcctccccc tgaatgaagc gtgcagtcag 7500
tgacagagac ctcagaaatg tcttaggtca ccaaaggta ttcttgccat cccaggctcc 7560
agatttagcat ttctccctt ttatattccc tccatttgc ctgtctgcat atgactact 7620
aacaaaacatt cttctttct ttttttttt tttcttgag ctgggactg aaccaggc 7680
cttgcgttg ctaggcaagc gctctaccac tgagctaaat ccccagcccc gctaacaac 7740
attcttaat agaattctaa atttttaaa gtcaatttc cttttactc aaaccctggc 7800
attttacaaa acattttca cttatcaca aatcttcaat atctttctt tatctttata 7860
tcattgtatg ttactttta tctgtacgt agtattctgt tacgtattta ataaaatata 7920
cttggtgcat gatgcatgt ataaatggcg cttgggaaag taccctgtta ctatgtact 7980
gttgccttc agaaatgccc aggaccagaa atgttccaga gttttctttt cttttaattt 8040
cttttgatt ttgggatatt tgcacataaa taattatata tttgtatata aataatgata 8100
tatcctggaa acgagcaacta attctttgt tgcctgtttt ctggggtttt ttttttctt 8160
tccttccttc ttttggcttct tggccatcct ggagctctct gtagaccagg ttgtgctga 8220
actatagaga tcctcctgccc tctgcctccc acatgctaag actaaaggca agagccatca 8280
caccatctg tgagcacaaa tcttgatatt tcaccttgc ttatatacaga tggttgtata 8340
gtcagtcgt gtattcgatg ttttaatc tacatttca ctgtgacccctg ctacatgaaa 8400
ttcaaataca aacttgtcca ctcacacaat attggccctc aaaaagctgt gagccttga 8460
acttttgggg ttaagaatgt ttagcttgc tccgtattct tcgcttgc actctcttc 8520
tgaatcaca tgagttccta gcaaagaggt gaatagatag cacattggaa atcagcatct 8580
gtctctaaat ggtcttggaa agaaaactgta gatacctgcc tggaccagcc agacctgtgt 8640
cttagcacct attttaaaca ttgttctacc tgagttgtaa gatgcaaaac atatgtgggc 8700
tctgagggcc caaaggccctt gaacagggtt gacccatgtt gtgtgaaata gggagaaaga 8760
cagcagaagg aaggaggaa agacgggcaaggg ggggggaaatgtt gtttcatgt gtatggctgc 8820
atctaaatag aagccatgaa gactagctat tggttctcgt gtccttccaa cttgttttg 8880
gagacaggaa ccctcaccag cctggaaacctt gccaagtagc taattggctg gctcttgacc 8940
cctagatctc ttccctctcc actctaactg tacaacatac agctctctct ctctctctct 9000
ctctctctct ctctctctct ctctctctct ctcatttat tttttaaaaaa aaattttttt 9060
atttattttat ttattttat atttattttat ttattttat catggatgta atacctgtcc 9120
tgtctcaacc caaaatggg catcgatcc cattccagat gggtgtgagc caccatgtgg 9180
ttgctggaa ttgaactcgat gacccatgggg agagcagtca gtactctta tgctgagcca 9240
tctctcttagc cttttccccctt tttcttaaaa catagtttt gaagatctaa cgccatgttt 9300
caagtgtcaagc tatggcaagc actttgtca ctcaccagcc catgacccctc tcccttaatc 9360
tccaaatccctt ttagtggggaa gagacacaat cgttttactt tagccattgg aaagagcttc 9420
cttctaaagc agcttggaaa gccattgggg tttccagcgt gtgtgtggca gtgttaccag 9480
gttattgtga tgggacaagt tcttattctc ttcttctgaa ggaggtaccc tggagacctt 9540
ggggaaatggg ggggtggtagg gaggtttatg gcattggggc agggagtgaa gaagagat 9600
actgctgaga gcaaaggat tgtagatcc aacaatctaa caaaaaggt caaacttttt 9660
tttctttat gacccatgtt gtgataacag aaaaatagta atgtaaatgta tgtccacttc 9720
acagaatccct cataagatata tcaagaccat aaatgtgggc cactcttact ttgatgccc 9780
gtagggggcc cctgagccaga tgcagcttag ttaataggat gcttgccttccat gatgtttgt 9840
acatgttcca ccctcactgac acagccagcc atcgatggaa acacttgcgtt cccctagcac 9900
ttggcgggag gaccaagagt tcaagttccgt ttttattat gtgtgagtt cagggtagc 9960
atgggctata ggagactgta gagggctatg tgattaagaa cagatttgc gcccacaggg 10020
ctcctgggtgc agcatgagtt tgaggaacta gtgtgtatag catgctttc cttcttcttgc 10080
gtatgtcaag tgactttcta gacgcatgt tggcatgaa cttagaactaa cattattggg 10140

ttcaagcctt ctcaggcagg tgcataagta cacagtata catgcacaga aaacacataa 13620
acataaaata aataaattaa aattttgaaa gtttttttg ggtggaaagg acttttaagt 13680
aacattctat gttatggAAC aagtgcattc aattttacta agtttttaat ttttagcttt 13740
tgtttgtttt tttctgttt ggaacaagg ctgtgtatc ccaagcatcc tcaaagttgt 13800
tgtgtacgaa aggatgaccc tgaattttt tataactatc ccttctttag ggcacgcatt 13860
ttaatatagg caaaaataaac tttaaacttt gtttgcgtg caggtatata tgggtgcaa 13920
gtgtatctgt gtgtgtgtgt gtgtgtgtgt gtgtgtgaga gagagagaga 13980
gagagagaga gagagagaga gagagagaga gattagagaa taacttgg aagttctc 14040
cttctaccct gtgggtcccc gggtaaactc ggggtataag gctttgcacc cttttccca 14100
ctgagaacctt ctgcgtggcc tcactcccta ttttattttt ttgggtggcag tactattgt 14160
tttgaatccc atctgaagct tggtttgtt gtttgggttt taaggcagtc ttaactgtga 14220
cctaagctgg tttaaaactc acaggaatta tccacctcca cctcccaagt gttggggta 14280
cagatgtgag ccccaagcct gagtgcctt gaaagctgtt ttttttattt tcaaaaactat 14340
cttttctctg tgttaggtc tgatttagt gtttttagg tgggtgtcagc atgatccatc 14400
actctccagc tattattctt aaaatgaagg gtcgggggc tggggattt gctcagtggt 14460
agagcgctta ccttaggaagc gcaaggccct gggttcggc cccagctccg aaaaaaaagaa 14520
ccaaaaaaaaaaaaatgaa gggctgggt gctgaggaaa aagctcagtt gcaaaaaaaaaac 14580
atgaaaacctt gattcaatct gtaaaagccca cataaaagcc aggcattggc gcatgcacct 14640
ataaaccggcacttggggaa acagaacagg agaataccaa gaacttgcgt gtcagtcagt 14700
ctagtttaat ttggtagtgc caagctca gatggcattt gttttttttt tttttttttt 14760
atctgtcattc aagacctggc ctccatacat atatgcacac atgttactcc ctcacatgaa 14820
acatattttt aaacaaacat atgcacacac ttgtcatac atgaacagat atctatattt 14880
gcatacacat taaaacacac acacacat atatataca aagtgtgtac aaacataggc 14940
atagtataca accatgcata atgcacatg cacatcatg aatgcattca tattcacaca 15000
tggacacatg aacacataca tatatgttat atcttattt acactccatt actatcccc 15060
agtccaggtt tcaaatattt acaaacagaa aagccggcta ctacctgtac tttttccca 15120
ttgccttga acagcgatct ctcgacacatc gatccccgc gtcgtccctg cggcagagct 15180
tcatccggaa acaacccccca tgcactctat tgattttat actggggattt acctggagcc 15240
ttgtaaagct aaacacattt tctactgcta aatacttcat tctttgcccc tttccatgg 15300
ggcggtttca atccagttt tttagtgtg ttcttagatt taagcatcca ctgtacaga 15360
ttcaaggata ttttattt ccccccaata acagtattt gtaggtgtaa ctttgcgtt 15420
tttccccagc ggctaattt aattgcttc atgaatagcc tattctggaa aagtaatttt 15480
ttttttttt tttttttt gtttctttt ttcggagctg gggacccgaaac ccagggcctt 15540
gchgcttcata ggtaagcgct ctaccactga gctaaatccc cagccccaaat tctggacatt 15600
tcttataaaat gtcactatgc ttttgcgtt ttttgcgtt tgcaacactt ttttgcgtt 15660
ttatggctca atactggctt acttatggat ctaccacact atctatccat tcatttcac 15720
atagtcatgg gtggtagttt tactttgggg ctattataag cttgttagga gtattttatga 15780
ccacatctt agatgcactg atgcattcat ttatcctaag aacagatctt ggatcatatg 15840
gtgggtctgt gttcaaacat cagaggcacc accattttt ttataatagg catttaagat 15900
ttgggtatct tctactggg ttgggtgtgtt acatgcctgt agtcccagct cttggagggc 15960
agaggcaagt agatccgaat tctcgcccta tagtgagtcg tattagtcga c 16011

<210> 17
<211> 18605
<212> DNA
<213> Homo sapiens

<400> 17
ttaaaatcttc tttttttttt ttttgagatg gggctcttctt ctctagccta 60
ggcttagatgtt caatgggtgtt atcttggctc actgcacactt ccaccccttccca ggttcaaggg 120
attctcctgtt ctcagcccttcc caagtagctg ggactacagg cgtgcacaac cacacccgac 180
tagttttgtt atttttagta gtgtatgggtt tttaccatgt tggccaggctt ggtctcgaaac 240
tcctgacccctt aagtgttccc tccaccttgg cctcccaaaag tgctgggattt acaggtgtga 300
gccactgtgc ccggccaaaa aatattaaat cttgaggcactt atgcaggatg aagccatgt 360
cagacccaaat ttccgtatgtt actaaaaattt ggaggggatc acacttcatg gttttgtttt 420
tttttgggtttt ttggagacag ggtcttgcgtc ttttgcgtt gctggagtc actggatcga 480

tcacagttca ctgcagcctc aaactctggg gctcaaacaa tcctcctact tcactctcta 540
gttgggacta caggcacaca ctgctgtgct cgactaatta ttattattat tattattatt 600
attattatta ttattattat tattttgtag agacagggat cttgctatgt tacctaggct 660
gttcttgaac tcctgggctc aagcgatcct tccgctgcag cctctcaaag tgcttaggatt 720
acaggcatgc ccagccactt tggggcttt ttaagccaac agcaaaaaaa gactataaga 780
gagaaaatttc cccttggctg tcttgttca tggattcggt gaaactccc taaaacagcc 840
ggtcacagaa aaagatatgc caaggaaaat tacttgacag cactcagtc aagtgcatt 900
ttaaaaagag actattgcct cctccatctt aaaagaactg accttttgag ccatgagaaa 960
tgaaaacagag gcatctgatc gaatgataac aatgcacttc tgaagatca aacatcgaa 1020
cttcatgcat tggacacata tctattgaat gactctaag tgaacataact gtccctgcct 1080
gcttccagag ggtactagag aggtcggaga tggttcataa aggccctcac atgtgctgtc 1140
atatttaaca atcagaaaagg tacttgagc aaagaatctg atcatcttg ttttccttg 1200
agaaaatgcg ctcagagagg tttactgaca atccaaagg tgcttgggt gtgcttaaga 1260
gatctgggt taaaacctca gactgctgtc tactatggcc tgggtcagaa agactgggt 1320
tggaaattcc tttccaccac tgctgtgtt ttaacccct ccaaaccctag attctcaaca 1380
ataaaaatggg ggtagggagg gaattaaagt atgtaccta ttttttagag acaacatctt 1440
gtctgtcgc ccaggctaga gtgcagtggt gcaatcatag ttcactgtag tctcaacctt 1500
ccaaagctcaa gagatcctcc tacctcagcc tcccttagtag ctggaaacttc aggtacact 1560
acgcccagct gctattttt atttattat ttattgagat tgcacatcac catgttgc 1620
aggctggcta cttaaaaaaaaa attttttttt tcaagacagg gtctcactt gccaccagg 1680
ctggagtaca gtgacagagt ctcagctcac tgcaacctct gcctccagg ctcaagtgt 1740
cttcccaccc cagcctccca aggagctggg attacaggtt cccaccacca cacatggcta 1800
acttttatt tttttagag acagggtctt gctatgtgc ccaggctggt ctcaaactcc 1860
tgagctcaag caatcctcct gctttggctt cccaaagtgc taggattaca gttgtgagcc 1920
accatgcctg gccttggca cttagttt gctttttt tttttttt agttggagtc 1980
ttgctctgtc atccaggctc ccaggctgga gtgcagtgc acaatctcag ctcactgcaa 2040
cctctgcctc ctgggttcaa gcaattatcc tgcctcagcc tcccaagtag ctgggaccac 2100
aggtgtgcac caccatgccc agctaattt tatattttt gtagaaatgg gggtttcacc 2160
atgttggcta ggctggctt gaacttctga cttcaagtga tccgcctact ttggcctccc 2220
aaagtgcgg gattacaggg aagagccacc gtgccggct gcctacttta atttttaata 2280
aagggttgtt atataagggg taggtgagag aatgaagtaa aattgagtgat tacagtctcc 2340
agttgttaat cacattataa ttattctt taaaagttt ccaacaagtt atttaaagaa 2400
tcgaatggaa cccttggaa atacagtgtt catgcctcta gtattaatgc cagttttac 2460
ttcgaggcca gcaagctaga ttccgatggc cttcccttcc caggatggg agcggatgt 2520
tgacttcaat ttccccctt ccgttacttc tctgtccac atcatttctg tgctgatgca 2580
gggacgattt ccactcctt tacagctgtatgtaaaag cctgtcggtt gcaagtcatt 2640
catcattttc cgcagagctt taccctcactt cttcccttcc caggatggg agcggatgt 2700
tgactctctg atctaggccc attgcagggat gaggccagg ctcaggagtt tccagggtga 2760
aaaccaggtt agcttgatgt tggaggatg aagaaggacc caaaagggtc tgagatgc 2820
agctctccag atgggcctgg gaggctgcag gggaaaggc ctctctttt atccggagg 2880
cctggtgcaa ctctagttt tttcatgtt gttcgagta acagcagtc acatgaagcg 2940
gtgcaccatg ttcattttac atggattcat ctcaaggact gcttacaaaaa agggcaggaa 3000
gtagctgatg ttctttccat cttacaggtt gggaaattgtt ggcattgggaa ggcaaaagtt 3060
cttgccttgcgtt gtcataatagg tagaaagcag cactggcaga ttcaaagcca gacatctact 3120
ctcagataca cgcctgggc ctcaaggccca gttgcctgg gcatttcct ttaatgtctc 3180
ctctctggaa gtgaatgggt tcatcagaaa gttccagtg ccagcacca tcaatgactg 3240
tcccagttagt agcttggtca aatcccttta cccctgcagg gactcaattt tctcacctgc 3300
aaaatggggg tattaataaa gccacccccc gcaccccccgg ccccccagccc ctccacctgg 3360
ttgcaagagg agtgggtgtt gactaaggcc ctgcgtcaag tacagaaccc aggagggtc 3420
tgcccaactt taaccctctc tccaaatctt ctacgcgttca gcaagcagaaa cccacgtgg 3480
actggggctt gcccccttcc gggccttccc caagcagagg ggtccccatc tagcccccg 3540
ggcaacggc gggcggtggc tgcgtgaagg gcccccttccc ccgacgccccgg ggagcaggaa 3600
ggccactcgg caccatattt agtcaggggg agccggcagc ccagagctgg tatgcggcgc 3660
tgggaattcc tgcaggaagg agtccgcgttcc tggccctttt gggttgtctc ccggcccg 3720
ctcccggccg tcccggggag ggggaccggc cggggccggc cggggccggg aacctcggag 3780
gagctgggtc cgcggggggc ggggacgcgc cgggctgc cggggtcccc ggcctggcgc 3840
ggggccagcc caccgcctcg acttcctttt atggcctgtt gttgcgtgcg tggacaggag 3900

cggggagggga gggacgggga gaagacggag agcctgggga agagagagag agaaaagcgca 3960
gagataggag tgagacacgc gggagagatg gagagcaaga gacacagaga ccagagacaa 4020
agttagacag gagggagaga cagatacatc gacagatcta gagaagcgag agggacagag 4080
acaaaagata gagcagaga cagcaatgt cagactgaca gacatgcaga gacagtggca 4140
gagacagagc gagagagcct gtatggaga gagacaggaa atgcaattt aggcgaggaa 4200
tccttgggga agggaaatgg ttaaggaa ctcgcagact ctggggcac acccacttc 4260
tccttggatc ttgacacttg catttgtaa ataacgtaat tatcaccgc accgccttc 4320
cccatttgt agctatggac accaagtctc agagaagtga agtgaacttc ccaaggtcac 4380
gcagctggcg agtggcgac aggggaggg gacagctgaa ataatcacag tggcttatt 4440
tttaattttt atttgttattt tggctgtgt gatgtgggtg gaggtggaga tggcaagttg 4500
ggaaaagtaa aaactcccc ttcctgcacg gttcccagca agggtggggg cctcctgtct 4560
tgcactttgc aaagtcaag aaatccccct tccctaccct tcacgctgca cagccggccc 4620
tcttccaga cagtgcgatc ccaataaaat gggaaatggg gtggagatg tcaagtca 4680
tccaccacag ccccgacacg gggaggaaga ggttaaagcc tttgcggccg gaaccgactc 4740
agggaaagacg ttctcaagca tcccgacag acactgcctg ctcgacccccc tttctctagg 4800
gatccggagc gtctgcgacc gcctggggcc gggctgaga ctccctgtccc tgcgcacc 4860
tggtccgtgc gcccgtgc ggtgcgcacc tggtccgtgc acccttgc accgcgc 4920
agctccgtgc gtcggccg ggggtgcgcc ctgcaggggg cgccggcggag gggccgcgag 4980
ggaccctccc caactccacc ctttcggcct cttccctt cccagccgcg ggcagctccg 5040
ggtctataaa gagaggcgctc cgaggacgcg cagggagatt tggacgctcc ggcctggag 5100
gtgcgtcaga tccgagctcg ccatccagg tccctccac tagtcccccc agttggat 5160
ctgttaagtat tagttgtcat tctggggca gattgcaggg caggggggtt taaaagtcc 5220
tatagggtat tctatagggg ctgggggtc cttaggggtc cctgttgc acctcgtaag 5280
ggccatgggt gggcagagt tggatggg atctctctc gccttacgt cttagattat 5340
cttagacttt ccccaaacag catttcttaa gattgcagt gagaagtacc attttgggg 5400
tgcttattaa cgatatcaat gcctggaccc aactccattt cccaactcta gaatccccag 5460
aaaaactgcc taaaaaaaaaa aaaaattatc cccgagtgtat tctgttaag aggctaatcc 5520
aggagatag ctcccttggaa atctcagag gtccggcgtc gacaatcaag gcatctca 5580
tttattctag gcacaaaaaaa attacagct gaatttcact gaaaagtccat ttgctatcac 5640
acagaagggc aaagtggggc tccttgcgtt tttgaccgtt ttgcacagtt gtgttgataa 5700
tgcattaaat cagttaaaaaa cacatggcgtt taggcttagc agaaaggagt gttgttgg 5760
tttttttta atcagtttag gggaggttct tctatgttgc gaaaaactgg gagataaggc 5820
tgggtgtcat ctatgggtt acagccact ttttctctt ctccaaatta aaaaaaaaaa 5880
aaacaactca cccaggttgc ccccaaaggg ccccaagata cccaggtggg ctccaaagtc 5940
tccatttgc tccacgatct gcaggtgcgt taggttacat tacactagaa tttccgcag 6000
agccacactgt gtcaatgcca ctctcgtgcc caaccaaactg ggtttttttt ggggggggg 6060
ggctactgccc tggtaagt tttttccat cacagggtct ggttagggatt ttgccacttg 6120
agaaaaaggtt ccatttttttccatgttgcgtt caagaaatccat ttagaaaccc 6180
aagggtggggat tggatggggat ctttttttttccatgttgcgtt caatgttgcgtt 6240
ccgggggtttt gaaaaaaaatccatgttgcgtt ccatttttttccatgttgcgtt 6300
cttttgcattt ctcaacgttccatgttgcgtt ccatttttttccatgttgcgtt 6360
tggatgggtttt tggatgggtttt ccatttttttccatgttgcgtt 6420
atgttttttttccatgttgcgtt ccatttttttccatgttgcgtt 6480
acatttttttccatgttgcgtt ccatttttttccatgttgcgtt 6540
atgcctgtttt agtatacaag gcatgttgcgtt ccatttttttccatgttgcgtt 6600
aagtgggtttt tggatgggtttt ccatttttttccatgttgcgtt 6660
tccatttttttccatgttgcgtt ccatttttttccatgttgcgtt 6720
cttccaaacaa agttaatgtt ttttttttccatgttgcgtt ccatttttttccatgttgcgtt 6780
gcacatttttccatgttgcgtt ccatttttttccatgttgcgtt 6840
cattgttttttccatgttgcgtt ccatttttttccatgttgcgtt 6900
ccggggggggggcc gggggggggggcc gggggggggggcc gggggggggggcc 6960
agatgttttttccatgttgcgtt ccatttttttccatgttgcgtt 7020
agggcagaga ttttttttccatgttgcgtt ccatttttttccatgttgcgtt 7080
ggcccccctccatgttgcgtt ccatttttttccatgttgcgtt 7140
ttgtcttccatgttgcgtt ccatttttttccatgttgcgtt 7200
ttggggggggggcc gggggggggggcc gggggggggggcc 7260
gggtggggggggcc gggggggggggcc gggggggggggcc 7320

cttccacgtt aggcacaaggc gtgttaattcc aagagcagat atatagtaga tttttcttga 7380
aaaccaagtt caatattcaa tccagttagaa tcataagaagg ccataagcaa attaaaaat 7440
catctcccgcc acctccccaa acctcaactt ctcataccggg aaatggggct aatgagaata 7500
actcatgttt ttgggcaact ttgcctggc gagatgctaa acgctttgt gacattatct 7560
tacgttcca taacaaccct ttagagtaga tactgttatt ctaactggct ttatTTTACA 7620
catatggagt ctgaaaact tgcttaagat agctcagcta accagtaagg aaaagaagat 7680
tctacaaatc taggtcttcc taactccaga gttcacaga ttaccctcat gggaggatt 7740
gatgagctaa tgtgtatgaa gggttagca cagtgccctgg cccctggtaa gcttcagtga 7800
tggttattta tagcaaacac aaccagagag ttcaagatgt ttgctca gtcatggct 7860
catcttggc agaaccggga agcctaaact atgtggccgt taaaggagaa gcttcttta 7920
atTTTCTTC ctttgcattc ataaacctcg tttctatttgg gctgaaaatg ggtgattaga 7980
atctttataa tattaagcta ccattccctt cctggattgg gaatgttaca aattccaatt 8040
acatttggttt agggtttgt ttgtttgtt ttgagacaga gtcttgctc gtcgcccagg 8100
ctggagtgcgta gtgggtcgat cttggctcac tgcaacctcc gcctccttagg ttcaggcact 8160
tctccagcct cagcctccctg agtagagagt agctgggtt ataggcgcacc accaccatgc 8220
ctggcttaatt ttttgttattt ttagtagaga tgggtttca ccataattggc caggctggc 8280
tcgaaccgcgat gaccaactt gattcgcctg gcttggctc ccaaagtgcgat cagattacag 8340
gcgtgagcca ccgcgcctgg ctatTTAAG gtcttgatgg catactttaa gggatggcct 8400
tttgccttc taggtcttct cttccactc ctgacccccc aacttttaac cctggccaca 8460
caatggagga aagactgaat ttagagaaaag gcaggcaaga atttggaaaga aacccctgtat 8520
gtgatccaag gacagaggaa gaagctgctc acagtggctg aaaggggagg tcggacatct 8580
gtgacttgc tcaagggtttc aggggctaaag gaggacaac ctcataaag ttgcttagaa 8640
agggccataag aggccaggta tggcaggta tacctgtaat cccagcaatt tgggaggctg 8700
aggtggggggg atggctgaa gtcaggagtt tgagaccaga gtggcaaca tagcgaggca 8760
ccatctctac aaaaaaattt taaaatgag ctggcatgg tggcatgcat ctgtagtcct 8820
agttattcag gaggttgagt gaggcaggag gattgttgc gcccaggagt tcaaggctgc 8880
cgtggccctt gattgcattc ctgttcttca gcctggccaa cagagtgaga ctctgtctca 8940
aaaaaaaagggt gaggggcata gaactttact gtaccaggct gaaaaataca aggcccagag 9000
agggcaagtg acttgccttag catcacccag cgagtttgg gcagagctga gacttgcata 9060
tcgaagaccc aaggatcttcc cacaggctaa tgaatagctt gttgtgc taaaatgatgaa 9120
gcagtgagtt gttaggacag gactgtgaat agggctgaca tattcagatg tgcataacat 9180
cgctaatttcc atctctgagt aaatttaggt tcaaacatcgat cgggatttca atcctgggtc 9240
cccaactttt gcaagggggg gccttgcatt taccttcaa gaccccgata ggcttagcag 9300
gaaaatggga ataatacgata atgccactt ttcatccttgc gactttttgt ctaatttat 9360
gaatttatctt gttagataaa ttcccagaaa tgcccttgc tggatggaa gcatgcgtat 9420
ctaaaattaa tagatattgc aatgactgg ctaaaagacat tgcagaccag gtgcagtggc 9480
tcacgcctgt aatcccagca ctttggggagg ccgcagcagg tgggtcacct gaggtcagga 9540
gttcaagacc agcctggcca acatggctc tgctaaaccc tatctctact aaaaatacaa 9600
aaatttatctg ggcattgtcg tgggcacccctg taatcccagc tactcgggag gctgaggcac 9660
gagaatcgct tgacgcctcag aggcagaggt tgcatggc cgagatcaca ccactgcact 9720
ccagcctggg caaagagtga gactcggtct caaaaaaaaaa aaaaaaaaaagg cattgcaaat 9780
tgcaacttgc tgcagtcaca tatgacagca gtcccatcc tcttggcacc agagactgg 9840
ttcgtggaaag acaatattttt ccagggtgaa gtggggagga tgggtttggg atgaaaactgt 9900
cccacccat catcaggcat tggtagatt ctcataagga acgtacaacc tagatccctt 9960
gcagggtggag ttggcaatag gttttgtgt tctgtaaaaa tctaattgtc tttatctgac 10020
aggaggcggg gcttaggcag tgatggctac tcaccacccg tcccctcctg ctatgtggcc 10080
tggttcttaa caggccatttgc actgatactg cagcacaagg gttggggacc cctgacatag 10140
gagactatac atttatttttta agctgtggta tgccagaattt gtaaaatataa aacacagtg 10200
gggttttag ggccagaaat aatcagttct tgctcgctt cagaaggcata cttcacaggg 10260
gctaccgtaa ctcttgcctt ccaagttctc ttgggtggaa ggaaaaaaaata gtttatgca 10320
ttaagagaac ttcttctgg agttacttgc aaccattggt attcagatga ttaggcagat 10380
gtcacaaggc aataagaatg tgacagggttc accattcaact tttttccctg taaaagtgaa 10440
gtagggctttt cttggcaaca agcccttggg aggtggggggg atgtgaatgg tgaggggagg 10500
gtagaaatgg tggagtaggg tcaggggcaaa gaaagggact ttctgctaa gatataatcg 10560
gtgtccattt actcttagca gaaaacttagg attagattct ggattgtact cctgactcca 10620
aattttacaa gtgggggtct tgcatttacc ttccaggacc tcggctcatct tagcaggaaa 10680
atagcaatag caggtgatgc caccttacag agcgcttagg agacagtgag atggctata 10740

agagcttctc aaccccgca gctccacccc agccagata tttcaggaa ttagggttcc 14220
aaggggcatg ctatggaaa caccattcta gcatgagtgc aagcttctca tccccatct 14280
tgctgtctt tgaccaaagc agatttgca cgtcgtaact gtcagagaca tcaaagccag 14340
agggaatcca gcctgctcca agctctcctt ttttgcacag agactgaatc tttgcacttg 14400
atcttggttt tgttttaag tctgaggta gacagggtcc caggcaatgg aggctgcgt 14460
gtcctttat tttctgttg tagctttgc tatttttct gacttttaag gcaactcatc 14520
cacatggcaa ttaggaagag cccacttagg gctggcaca gcggctcatg cctgtaatcc 14580
cagcactttg ggagaccgag gcaggcagat cacttgaggt caggagttca agacctcagc 14640
ctggacaaca tggtaaaacc cctgtctcac aaagaataca gggaaatagc tgggcatgg 14700
ggcaggtgcc tgggtccca actatggg aggctggggt gggaggatca cttagcctg 14760
ggaggcggag gttccgtga gctgaggta tgccactgca ctccagcctg ggcacagag 14820
caagaccctg tctcagaaaaaaa aaaaaaaaaaaa aaaaaagaag tccactttac ttgtcatagt 14880
gcttagaaca aatgaaacac tctccatggc ctcttggat gtaattggct accatctgca 14940
caaactcttc attattgcac aagaatatac atataactta tgctactgaa ctgtgtttaa 15000
gtggccgagg tggtaatgt tagctgtatt ttaccacaat taaagataag agggaaaggaa 15060
aatgaagtgt actttacaac caaaaaaagta cgctgtatgt gcaaaaaaagt gtgcagctg 15120
atgaattttc aagaggatat attttttata gatggggtc tcactctgac acccaggctg 15180
cagtgcagtg gcatgatcat ggtcactgc atccccgacc tcctgagctt aagtgatcct 15240
cccacctca gctccgtact agctgggact gcaggtgcac actatcacaa ccggtaatt 15300
tttgcgtt tgcttagagac aagggttcaac catgttgacc agggcggtct cagcctcctg 15360
ggctcaggtt atcctctac ctcagtctc cacacaggta attaaaaaac attttttctt 15420
agagatgggt cttgcgtgt tggccaggt ggtctcaaac tcctgggctc aagtggctc 15480
cccatcttg cttctcaaag tgctgggatt acaggcgtga gccatgtcac ctggccaaac 15540
agtttgcgtt atttcagaa agtgaacact cataggctg gcattcagat gaagatctag 15600
aggtcaaccc tcacaagccc ccctcacgtt ctgtccttgc aatcattgca caccggagac 15660
tcattcattt cttatctgag ttctatcacc gtagattaat tctgcctggt tttggacctc 15720
agttcaatag tcacagaacc tggctttt gtagaccacct tctttgcac aaggatgtgt 15780
tggtagatgt cttttttgt ggtgtggagc tggtagttac ttacactgt tcgagtccta 15840
ttttgggtgt ttgtaatgtg tcaggtactg tgccaggtgc cttacaggat tgattcctt 15900
atgggcacatc gacaagccca cccacccat gtgaaaggca gaaccaaata gactccagaa 15960
tgagacccag gtttgggtcc cagctctgac actttttt ttttgcgtt gaggctgact 16020
ctgtcgccaa ggctggagtg tagtggatgt atgtcggctt acggcaacct ccacccctcc 16080
gggtcaagtg attctctga ctcagccccc caagtagctg gggctacagg cacgtaccac 16140
caatcctggc taattttaa tttttgtatt tttagtagag acagggttcc acaatgttgg 16200
ccaaagctggt ctcaaactcc tgacctcaag ttatcctccc acctcagcct cccaaagttc 16260
tgggattata ggcatgagcc atcacactcg gcctacttgt gatcaatctt acttcatctt 16320
cacaccctcc catttctctt acgcacccctc cagttctct ctctctctt ccttctttt 16380
ctctctctt ctctcacaca cacacacacg atctgcgtgc acacctaag aaacaagaga 16440
ttatcaggaa atgattgaat atttggccgc atttcattt ttgctgcctg tttaaactaa 16500
ccttggttat actattaaaaa gaagacgcgt cgtatcaagc cacttctgtg actatggctg 16560
tccagaaata aacataatta aacatccaa cagtagtaaa tgctattggg taggaatgag 16620
cgaagtggct tagagtccacc ggaagtggaa aagggtatag aaacagaagg tacttgggt 16680
agatcagggg tggcttatct tttggcttcc ctggccacc ccagaaaaag aagaattgtc 16740
ttgggcccaca ctgtaaaatac actagacta atgatagctg atgagctaaa aaaaaaaaaa 16800
aaaaatcgca aaaaatatac tactgtttt agaaaagttt tgaatttgc tgggcccaca 16860
ttcaaagccg tcctggccc catgcacccct gttggctgca gtttagacaa gcttgggt 16920
gagagttca tctaaacttc atggcagctc tgcaggac ccgttagtc cccagtatta 16980
atatacagta aatctgagtc tcagatctac gtaagtcacc cagaagcact cattctgcag 17040
tggcagagtc acgtttgaat tagcatctga ttgcaaaagtc tgggtgtctt tacatgacta 17100
caggttatct tacctctcaa gaggaggcaa ccaatcaaat gttgccagca ccaatgaact 17160
tgtactttat ttaggctcag aaagatctt taggtaatg aaaatgcctt atatttatga 17220
aatgttctcg ttctctgtgg ctttctctt tttgagacag ggtctcaccc tgacacccag 17280
gctggagtgc agtgcgtttaa tcatacgctca ctgcacccctc aaactccgg gctcaagcaa 17340
ccctccctgcc tcagccctcct agtagctggg actacaagca cgcacatcatca tgcctggctg 17400
atattttttt taagggatgg ggtcttgctt taatgcccag tctggctcgg aactccctggg 17460
ctcaagcaat ctcctgcct tggccccc aaatatggaa ttatacatgt gggctactgc 17520
cagccctttt tcttcattt attttttaat ctatgggttcc ccctccctt tgggtgtatt 17580

ttatttgtta aagaaagaga gtactggccg agcgtggtgg ctcacacctg taatgtcagc 17640
actttgagag gccaaggccg gtagatcacc tgaggtcagg agtttgagac cagccctggac 17700
aatatggtga aaccgcgtct ctactaaaaa tacaaaatc agccaggcgt ggtggcatgc 17760
acctgtatact ctagtcctc gggaggctga ggcaggagaa tcacttgaac ctaggaggtg 17820
gagggtgcag tgagccaaga tcccgccatt gcactctagc tggcgacag agcatagtct 17880
ctcacctttg ggagttact gcattgtta gcatgctctc ctgtgccttgcattttccat 17940
agacaggcgt cagatctgga ggcttcatca cttcatccc ccattccat cccctttct 18000
ttttagcaag aatatgtcat tagtggtaac ggcacttcct gtagtggccc atctgcaggc 18060
atgttatgtt tataatgtct agtcagctt ctcttttgt gatgttaggg ttaatttagta 18120
gatttaggtt atggcaggcg gacccatccc ttaaaaattc cacaagagct cttcatctga 18180
tatagtcaat cttgtggtgg ggaccctaga ccagcatcat catcatcacc cgaaagctgg 18240
tttaggaatgc atattcttgg gccccatccc agtctactg actcagaagc taatgcacca 18300
ggaaatgtga gccccattgg cctaattgtt ttagcaatta ctggtagaac ttgccaactt 18360
gccaagaccc tttcttctt ctttttttc ttttttttt tttgagacgg agtctcactc 18420
tgtcgtccag gctggagtgc agcggcgcat ctccactcac ccactcactg caagctccgc 18480
ctcccaggtt cacaccattc tcctgcctca gcctccagag tagctggac tacacgcggc 18540
cgccaccacg cccggctaat ttttttttt ttttttagta gagacagggg tttgccgtgt 18600
tagcc 18605

<210> 18
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG PCR
primer 1

<400> 18
ctggagctct tattagtact ggggtccc 28

<210> 19
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: CArG PCR
primer 2

<400> 19
actcaggcca taaaaggaag tcgaggcaga gttgg 35

<210> 20
<211> 28
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Intronic CArG
PCR primer 1

<400> 20
ggccaagcca ccctggagaa acctggac 28

Arne

<210> 21
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: SM-MHC-4000
PCR primer 1

<400> 21
atgtcagatg tcctctcaact gctttattcc 30

<210> 22
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: SM-MHC-4000
PCR primer 2

<400> 22
agcaaacagc tttaaatacg tattggcttc 30

<210> 23
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Intronic CArG
PCR primer 2

<400> 23
cccagaactc aagccagtca ggctgcatacg 30